

**ABSTRACT**

Described herein is system for the inspection of a target object. The system may include a gamma radiation source, a gamma detector and an image processor coupled to the gamma detector. When the inspection system is operating in a first active mode for imaging a target object, the gamma radiation source directs radiation at a target object, the radiation passes through the target object, and the image processor images the target object based on an output of the gamma detector. When the dual-mode system is operating in a second passive mode for imaging a target object, the target object is scanned by a neutron detector for radiation that is emitted by the target object, the emitted radiation from the target object is detected by the neutron detector and an indicator indicates the presence of the emitted radiation.